

**REMARKS**

The Examiner is thanked for the allowance of claims 4-8, 21-24, 27, 31-35, and 48-51 and for indicating that claims 18 and 45 contain allowable subject matter.

By this amendment claims 1, 9, and 28-53 are cancelled. Claims 54-102 are added. Hence, claims 2-8, 10-27, and 54-102 are pending.

**STATUS OF CLAIMS IN FINAL OFFICE ACTION**

Claims 1-3, 9-17, 20, 25, 26, 28-31, 36-46, 48, 49, 52, and 53 were rejected under 35 USC 102(b) as anticipated by IBM Technical Disclosure Bulletin (Vol. No. 8A, pp. 338-343) (which will be referred to as IBM).

Claims 19 and 46 were rejected under 35 USC 103(a) as anticipated by IBM Technical Disclosure Bulletin (Vol. No. 8A, pp. 338-343).

**INDEPENDENT CLAIM 2 AND DEPENDENT CLAIMS 60 AND 65**

Claim 2 is now in independent form. Claim 2 recites

monitoring usage of the storage space by the entities; wherein said step of storing undo information includes at least assigning each entity with a segment for storing the undo information of the entity based on the usage

Similarly, Claim 60 recites

assigning one or more entities to a segment based on the usage of the plurality of segments.

Additionally, Claim 65 recites

wherein the plurality of segments includes more than two segments, and the method further comprises the step determining the usage of each the plurality of segments; and assigning an entity to one of the plurality of segments based on the step of determining.

The Office Action (page 3) states

each transaction (record) is associated with the first sequential segment (log file) that contains a free page (341). The log record for that transaction is stored there.

However, page 341 of IBM does not discuss “transactions” or state that records are associated with files (which the Office Action associates with segments) based on usage.

Regarding claim 2, there is no disclosure of a “monitoring” of usage, and then based on the usage monitored assigning a segment with an entity. For example, writing to the next free page may be performed without any monitoring. The system may just simply write sequentially without monitoring usage. Since the writing is performed sequentially, the next record can be presumed to be a free page until the end/beginning of the circular buffer is reached. Once the end/beginning of the buffer is reached, a check may be performed if the entity that wrote the pages of the first file are still needed. This may involve checking if the transactions that wrote those undo records have terminated yet, without ever monitoring the usage of the first file. In fact the first file can be presumed to be completely used without monitoring its usage, because the pages and files of IBM are written sequentially, and therefore the entire storage space assigned with the first file was written first. Thus, each entity writes to the next available free page regardless of any monitoring of usage of files, and consequently which file an entity writes to is not based on a monitored usage of the files.

Further, regarding claims 2, 60, and 65, in IBM, the entities are not really “assigned” to a segment, because each entity writes to the next free page regardless of which file (which the Office Action assigns with a segment) the page is in.

Regarding claims 60 and 65, in IBM, once the file is full, a new file is started.

However, both files of IBM are part of the same circular file. In contrast, in claims 60 and 65, as a result of their dependence of Claim 54, any segment to which the entity is assigned is a

separate circular buffer.

Additionally regarding Claim 65, in IBM, at best two files are considered, when assigning a transaction to a file, which are the full file and the new file to which the new undo information is written. In contrast, claim is 65 the usage of each of at least three segments are determined, and the segment to which the entity is assigned is determined accordingly.

#### INDEPENDENT CLAIM 54

Claim 54 replaces Claim 1. Claim 54 recites

storing undo information in a storage area that includes a plurality of segments;  
using each segment of the plurality of segments as a circular buffer; and  
adjusting a size of the storage area based on usage of the plurality of segments.

In contrast to Claim 54, IBM's undo log is a single circular buffer instead of including a "plurality of segments" that are each used "as a circular buffer". Thus, in Claim 54 there is a plurality of circular buffers ad not just one circular buffer, in contrast to IBM. On page 339, IBM teaches the reason to use a circular buffer instead of a linear buffer is to reduce the frequency of occurrence of the LOG FULL condition and thereby also suggests that a that a frequently occurring LOG FULL condition is not good. On page 339, IBM also teaches that the LOG FULL condition still occurs in a single large circular buffer if a long running transaction prevents the reuse of space (e.g., when the system is writing to the same place that the system wrote to one cycle earlier). One of ordinary skill in the art would have expected that having many circular buffers (one for each segment or file) increases the frequency at which the system completes a full cycle of writing to a circular buffer thereby increasing the frequency of occurrence of the LOG FULL condition. Thus, by having many circular buffers instead of one big circular buffer, one of ordinary skill would have expected there to be an

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increase in the occurrences of the LOG FULL condition, which IBM suggests should be avoided. Consequently IBM suggests that having many circular buffers, one for each segment as recited in Claim 54, is not good and should be avoided, thereby deterring one of ordinary skill from using the method of Claim 54. Therefore, Claim 54 is not obvious, and is allowable, over IBM.

#### DEPENDENT CLAIMS 14 AND 56

Claim 14 recites

said step of automatically adjusting the plurality of segments further comprises increasing a size of the first segment in response to a request from the first entity by allocating an additional amount of the storage space to the first segment.

Similarly, Claim 56 recites

wherein the step of automatically adjusting is performed by at least increasing a size of at least one of the plurality of segments.

The Final Office Action (at page 3) alleges that the size of the circular buffer is adjusted by adjusting the number of segments. The Office Action states (at page 5) that when a record is written additional pages are added to the file as needed, and that this is described on page 341 of the IBM reference. Although there are reference to files being made up of pages elsewhere, the only place on page 341 that discusses writing to pages is the last paragraph, which states

Log records are written sequentially beginning with log page L[1]. Log records can span the log pages. If current log page L[i] does not have enough space to hold the next log record, part of the log record will be written to L[i] and part of the log record will be written to L[i+1] (for i less than M). The Database Log is FULL when the contents of the next log page in the logical circle are still needed.

In other words, this paragraph states that when the present page is full, the system starts writing to the next page. However, this paragraph of IBM does not say whether or not the next page

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was already allocated to the present file, or even whether the next page is necessarily part of the same file. Each page of a file is already allocated to each file when the file is made active, and presumably, when a file is full, the remainder of the record is written to the next page even though the next page is part of the same file.

Specifically, in IBM, the total number of files  $T$  is related to the number of active files  $A$  and inactive files  $I$  by the formula  $T=A+I$  (p. 341). The inactive files all have zero pages allocated to them. Each page has 1096 bites, and each active file has  $N$  pages (p. 340). The paragraph bridging pages 340 and 341 states

The term “active” log file is used to designate a log file that is allocated  $N$  pages. The term “inactive” log file is used to designate a log file that is allocated 0 pages.

The implication of this passage is that all active files have  $N$  pages, and that once  $N$  is set to a particular number  $N$  remains constant. Similarly, configuration parameters listed are

- The *initial* number of active log files ( $A$ ).
- The *initial* number of inactive log files ( $I$ ).
- The size in pages of *each* active log file ( $N$ ) ...(emphasis added).

The user inputs only the “initial” values for  $A$  and  $I$ , implying that  $A$  and  $I$  change. In contrast to the initial values for  $A$  and  $I$ , there is no disclosure of  $N$  dynamically changing after the user inputs its value. The input for  $N$  is not referred to as an initial value, and is the size of “each” file, implying that once the user inputs the value for  $N$ ,  $N$  remains a fixed number of “each” file. In contrast to  $A$  and  $I$ ,  $N$  is not just an initial value. Thus, the size of the circular buffer is adjusted by changing the number of active files,  $A$ , and not by adjusting the size of each file,  $N$ . Since each file of IBM retains a fixed size, when an entity makes a request, the size of a segment is not increased, in contrast to claims 14 and 56.

CLAIMS 57 AND 59

Claim 57 recites

wherein the step of automatically adjusting includes at least de-allocating storage space in one segment of the plurality of segments, wherein the one segment includes other storage space that is being used by one or more entities.

Claim 59 additionally recites

allocating the storage space [i.e., the storage space de-allocated in Claim 57] to another of the plurality of segments.

IBM does not disclose de-allocating a storage space that is from a segment that has “storage space that is being used by one or more entities”. Claim 59 further recites that the storage space, from the first segment is allocated to a second segment. IBM (at page 342) states

The next allocation decision is not made until the last page in F[A] is full and a log record must be written to the first page of F[A+1]. At this time, F[1] will be truncated to 0 pages if and only if no log records in F[1] are needed.

In other words, when there is a need for more space, F[1] is either truncated to 0 if and only if all records in F[1] are not needed, or else none of F[1] is used. If part of F[1] is still in use, none of F[1] is de-allocated. In IBM, unused space is allocated to a segment by changing an inactive file with 0 pages to an active segment with N pages, or space that is used by a segment that is no longer needed is allocated to a segment. However, a portion of an active segment is never de-allocated or re-allocated to another segment. Consequently, IBM never discloses “de-allocating the storage space from the first segment” where “one or more entities” is “currently using the first segment” (as in Claim 57), and certainly never discloses the further step of allocating this segment to a second entity (as in Claim 59).

DEPENDENT CLAIM 58

New Claim 58 depends from Claim 57, and is therefore allowable for at least the same  
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reasons. Additionally, Claim 58 recites that the de-allocating step of Claim 57 is performed in response to “determining that the storage space is no longer being used by the one or the plurality of segments”.

#### DEPENDENT CLAIMS 61-64

Claims 61-64 recite various methods related to collecting or storing information related to the usage of the segments, which are not disclosed by IBM. Specifically, IBM does not disclose collecting statistical information about the usage of the segments (as recited in Claim 61), storing information related to the usage of the segments (as recited in Claim 62), placing the stored information in an array (as recited in Claim 63), or periodically storing information associated with usage (as recited in Claim 64).

#### DEPENDENT CLAIMS 3, 10-13, 15-17, 19, 20, 25, 26, AND 66-102

Dependent claims 66-102 are computer-readable medium claims that correspond to, and depend from, claims 2-8, 10-27, and 54-65, respectively, and are allowable for at least the same reasons. Dependent claims 3, 10-17, 19, 20, 25, 26, and 55-65 are each dependent on one of claims 2 and 54, and are allowable for at least the same reasons. Each of the remaining features of the independent claims and each of the dependent claims 3, 9-17, 19, 20, 25, 26, and 54-102 contain subject matter that is independently patentable as for example is pointed out above in regarding dependent claims 14 and 55-65. However, in view of the deficiencies in the reference relied upon above, the remaining features in the claims will not be argued at this time to expedite the prosecution.

CONCLUSION

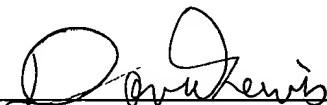
The Examiner is respectfully requested to contact the undersigned by telephone if it is believed that such contact would further the examination of the present application.

No extension fee is believed to be due. However, to the extent necessary, Applicants petition for an extension of time under 37 C.F.R. §1.136. The Commissioner is authorized to charge any fee that may be due in relation to this application to our Deposit Account No. 50-1302.

Respectfully submitted,

HICKMAN PALERMO TRUONG & BECKER LLP

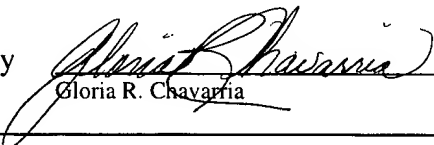
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on September 14, 2004 by   
(Date) Gloria R. Chavarria